

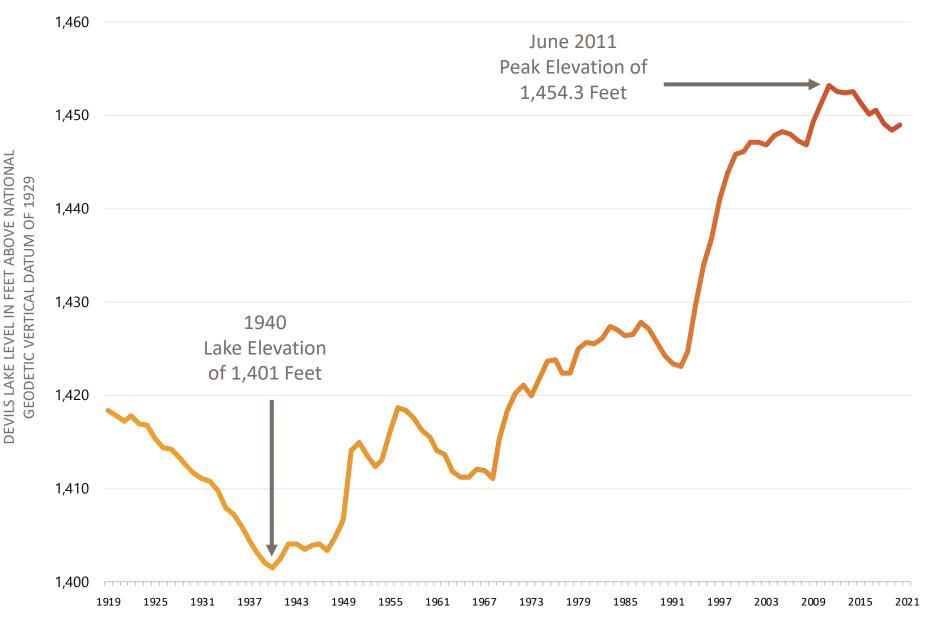




OUTLINE

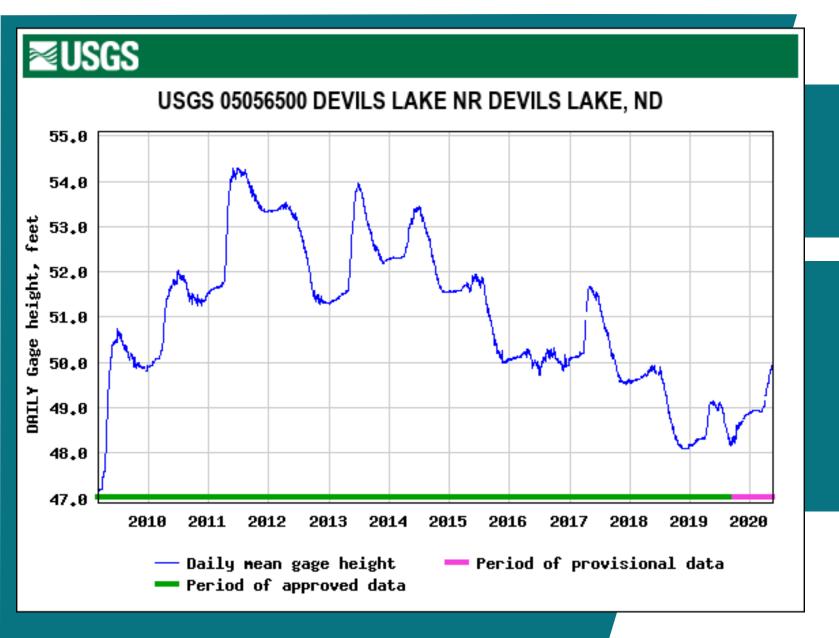
- Background & Introduction
 - John Paczkowski, Interim State Engineer
- National Weather Service Situational Update
 - Jim Kaiser, Lead Forecaster, NWS Grand Forks
- 2019 Water Quality Review
 - Dave Glatt, Director, ND Dept of Environmental Quality
- 2019 Operational Summary
 - Jon Kelsch, SWC Director of Water Development
- Outlook For 2020 Outlet Operations
- Status By Committee Members
- Final Comments

DEVILS LAKE PERIOD OF RECORD ELEVATION



^{*}Surface areas above elevation 1446 feet include Devils Lake & Stump Lake combined. *All elevations given in NGVD29.

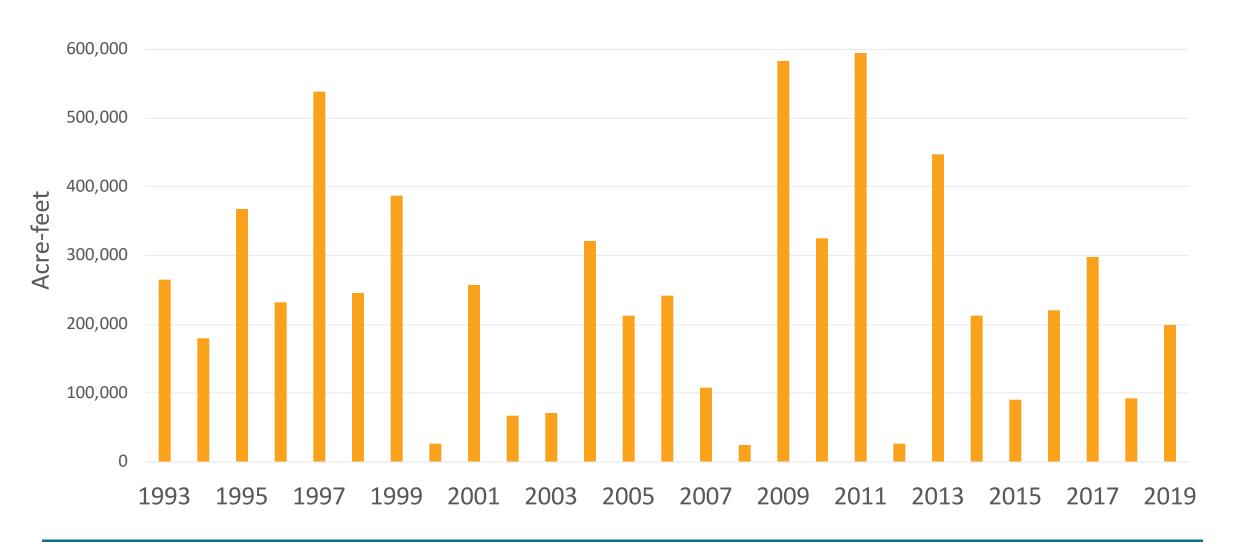
LAKE ELEVATION 2009 - 2020



Devils Lake Peaked At 1454.3 Feet In 2011

The Lake Approached But Did Not Reach 1448 Feet In 2018 & 2019

DEVILS LAKE ESTIMATED INFLOW

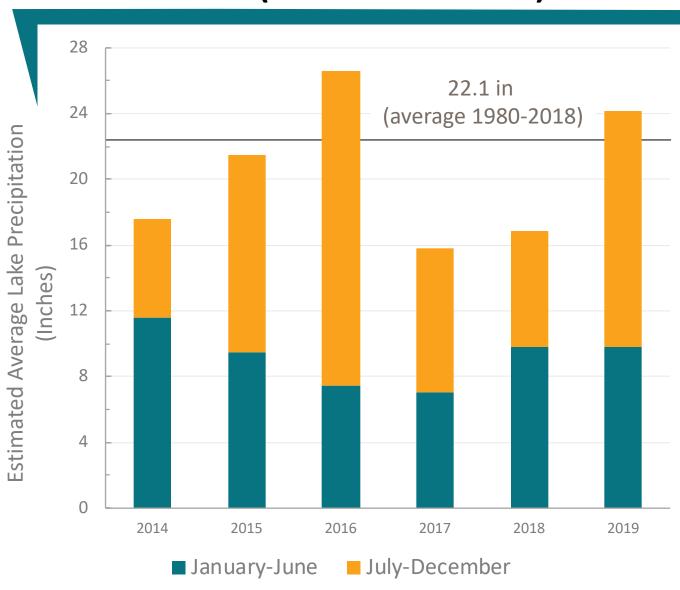


DEVILS LAKE PRECIPITATION (2014-2019)

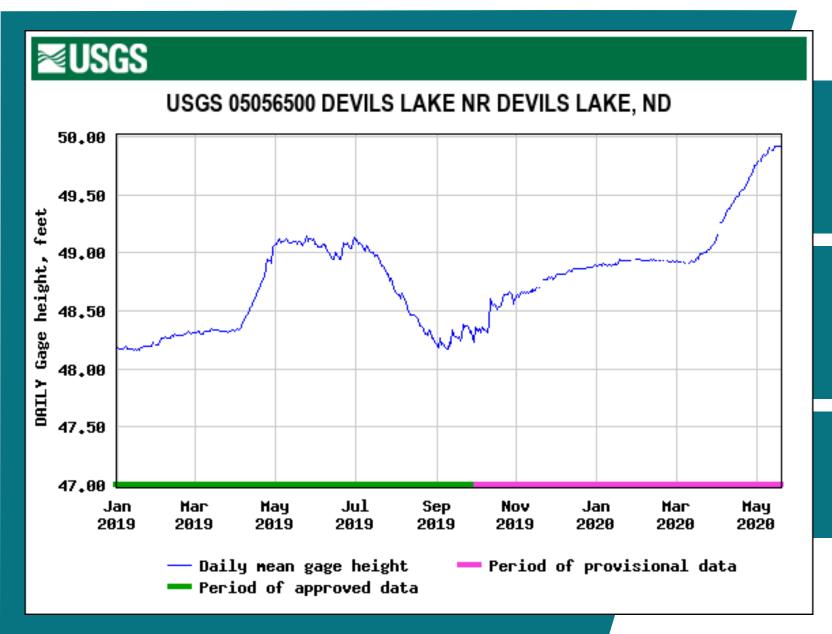
2019 Average Lake Precipitation Estimated To Be 24.15 Inches

Drier Conditions In 2017 & 2018
Contributed To Lower Lake Elevations

Lake Region Received 9-10 Inches Of Precipitation In Sep - Oct 2019



LAKE ELEVATION 2019 -2020



Devils Lake Peaked At 1449.15 In May 2019 & Was Expected To Reach 1448.0 In September

Significant Precipitation Caused A Late Season Lake Rise Of 9 Inches

Lake Has Risen over 10 Inches In 2020



NATIONAL WEATHER SERVICE UPDATE

Jim Kaiser, NWS Grand Forks

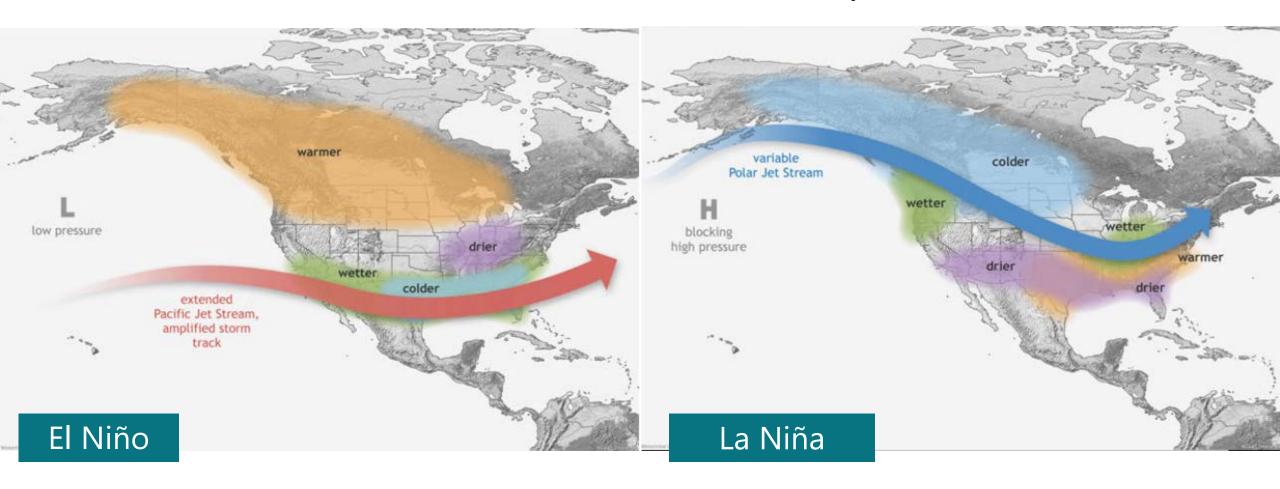






ENSO NEUTRAL (LAST FALL/WINTER)

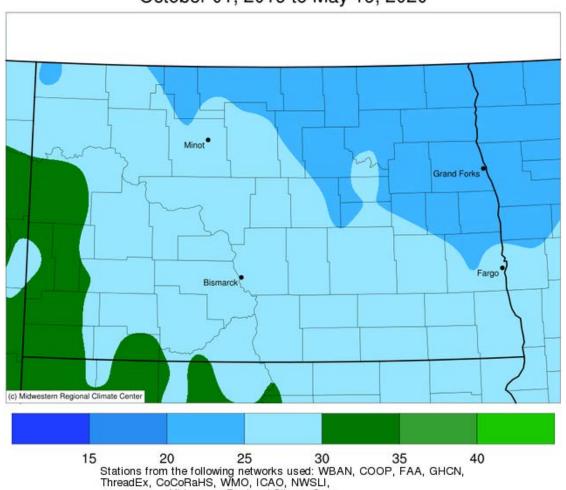
Not An El Nino Or La Nina Fall/Winter



AVERAGE TEMPERATURE (Oct '19 – Present)

Average Temperature (°F)

October 01, 2019 to May 19, 2020

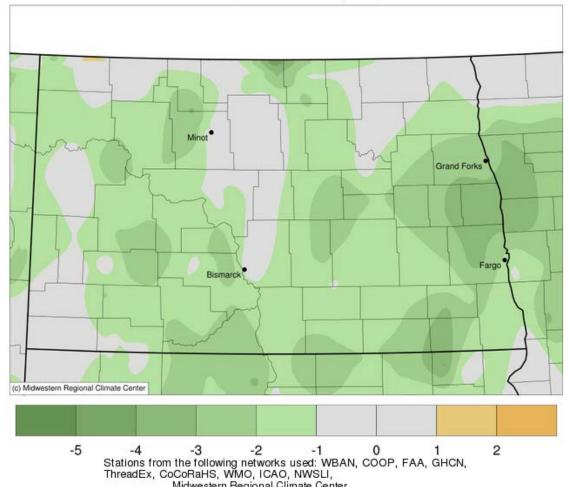


Midwestern Regional Climate Center cli-MATE: MRCC Application Tools Environment

Generated at: 5/19/2020 11:22:34 AM CDT

Average Temperature (°F): Departure from 1981-2010 Normals

October 01, 2019 to May 19, 2020

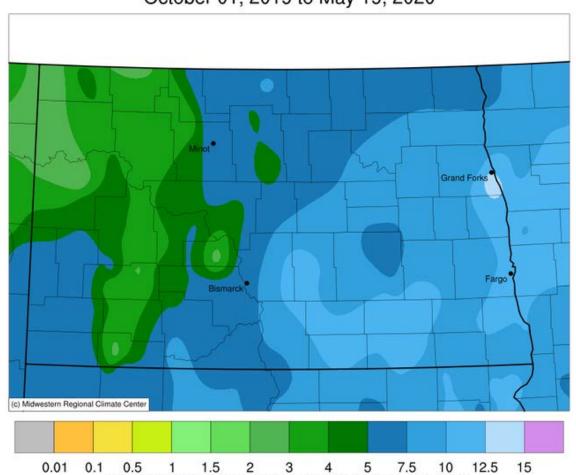


Midwestern Regional Climate Center cli-MATE: MRCC Application Tools Environment Generated at: 5/19/2020 11:08:57 AM CDT

ACCUMULATED PRECIPITATION (Oct '19 - Present)

Accumulated Precipitation (in)

October 01, 2019 to May 19, 2020

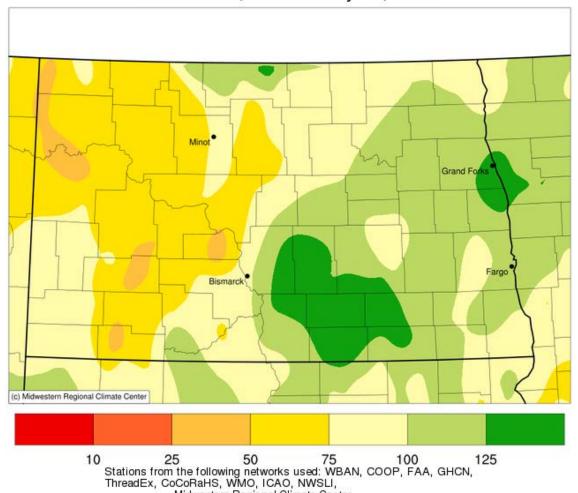


Stations from the following networks used: WBAN, COOP, FAA, GHCN, ThreadEx, CoCoRaHS, WMO, ICAO, NWSLI, Midwestern Regional Climate Center cli-MATE: MRCC Application Tools Environment

Generated at: 5/19/2020 11:24:26 AM CDT

Accumulated Precipitation (in): Percent of 1981-2010 Normals

October 01, 2019 to May 19, 2020

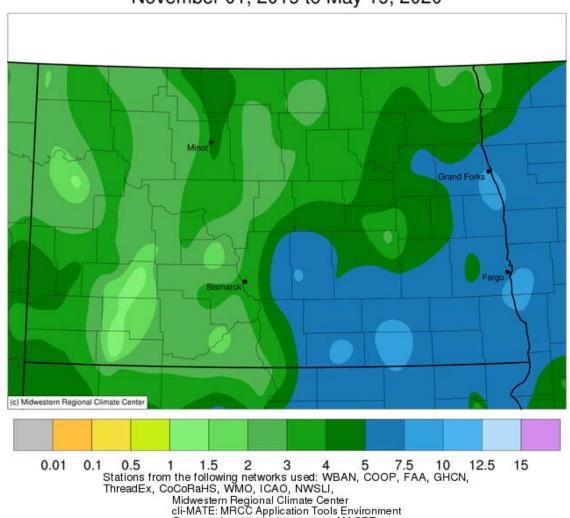


Midwestern Regional Climate Center cli-MATE: MRCC Application Tools Environment Generated at: 5/19/2020 11:27:30 AM CDT

ACCUMULATED PRECIPITATION (Nov '19 – Present)

Accumulated Precipitation (in)

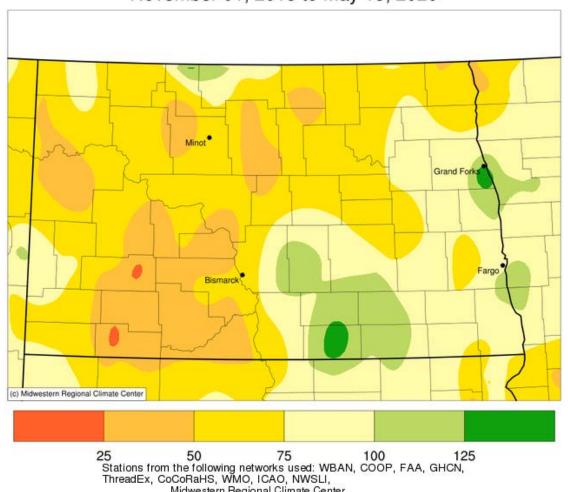
November 01, 2019 to May 19, 2020



Generated at: 5/19/2020 11:45:30 AM CDT

Accumulated Precipitation (in): Percent of 1981-2010 Normals

November 01, 2019 to May 19, 2020

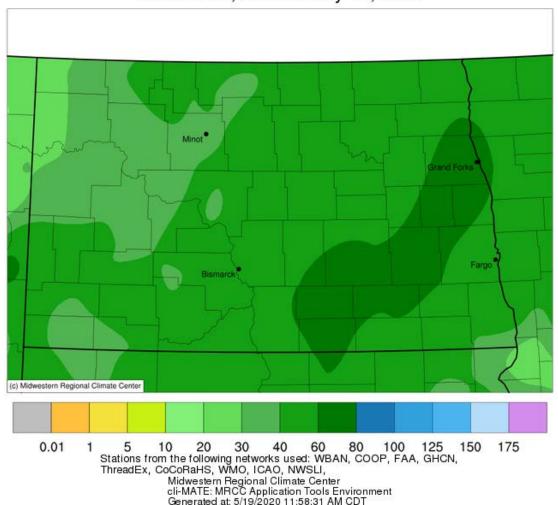


Midwestern Regional Climate Center cli-MATE: MRCC Application Tools Environment Generated at: 5/19/2020 11:43:33 AM CDT

ACCUMULATED SNOWFALL (Oct '19 – Present)

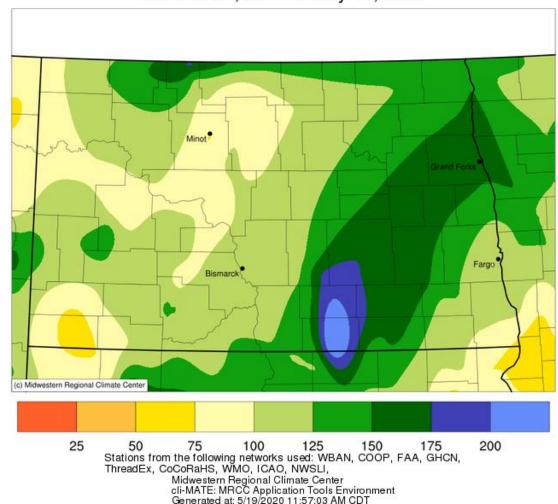
Accumulated Snowfall (in)

October 01, 2019 to May 19, 2020



Accumulated Snowfall (in): Percent of 1981-2010 Normals

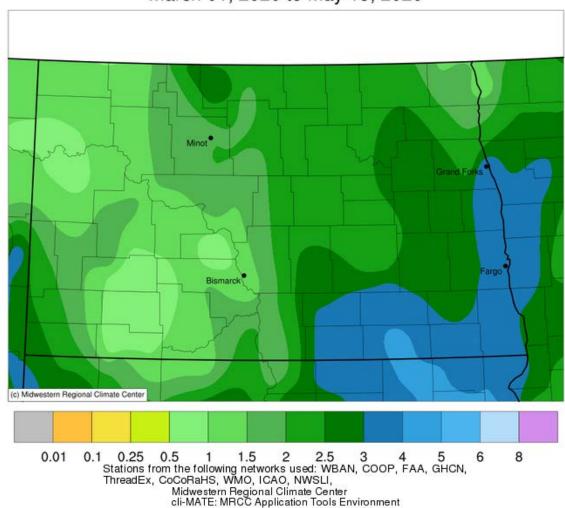
October 01, 2019 to May 19, 2020



ACCUMULATED PRECIPITATION (Mar '20-Present)

Accumulated Precipitation (in)

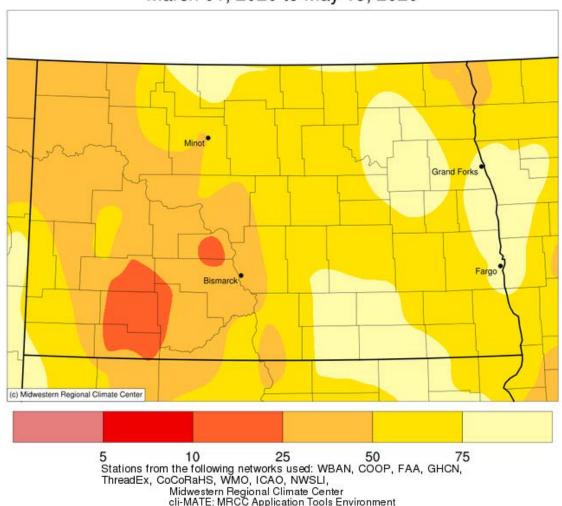
March 01, 2020 to May 19, 2020



Generated at: 5/19/2020 11:53:08 AM CDT

Accumulated Precipitation (in): Percent of 1981-2010 Normals

March 01, 2020 to May 19, 2020



Generated at: 5/19/2020 11:55:05 AM CDT



ENSO FORECAST (Current)

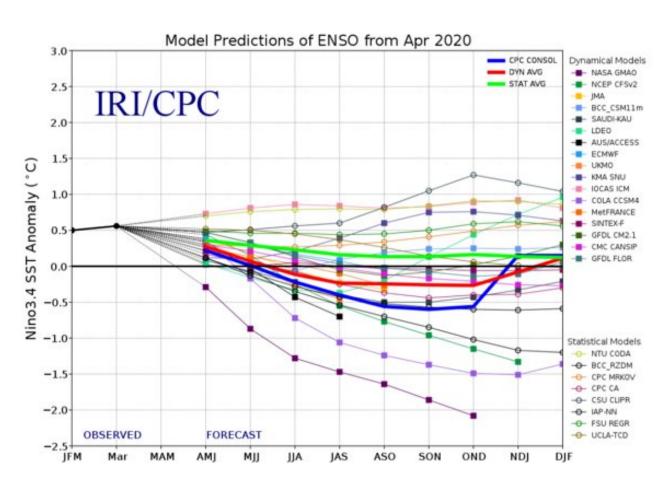


Figure provided by the International Research Institute (IRI) for Climate and Society (April 20, 2020)

El Niño Status – May 2020

ENSO Alert System Status:

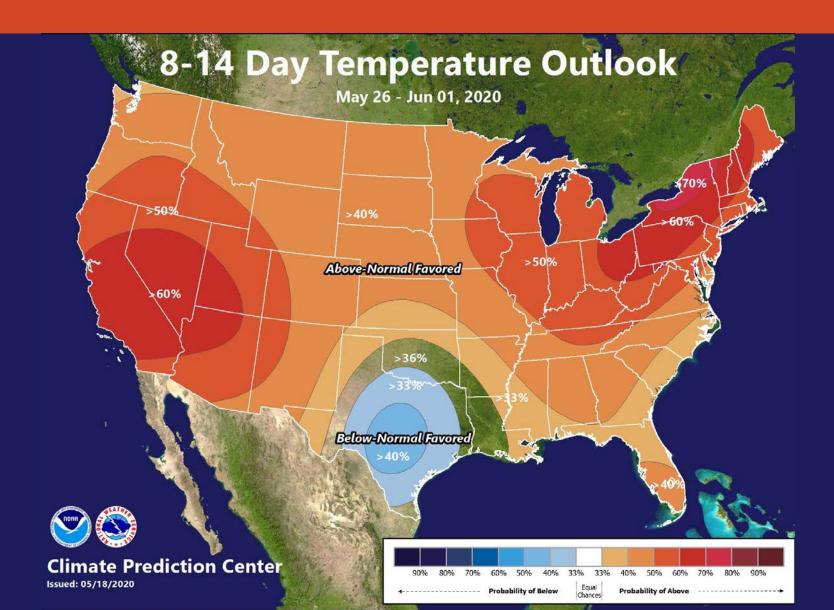
Neutral Status

Climate Signals Are In A Neutral State –
Suggesting A Near Weak La Niña
Possible For Fall & Early Winter.
(*April/May Outlooks Show Little
Skill For Winter Patterns.)

Other Teleconnections/Global Patterns Likely Will Have A Bigger Impact.

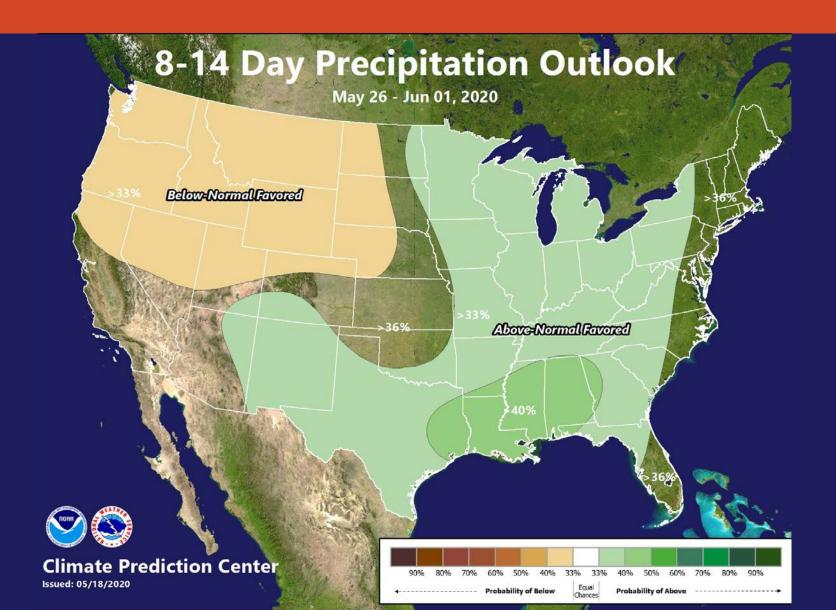


8-14 DAY TEMPERATURE OUTLOOK



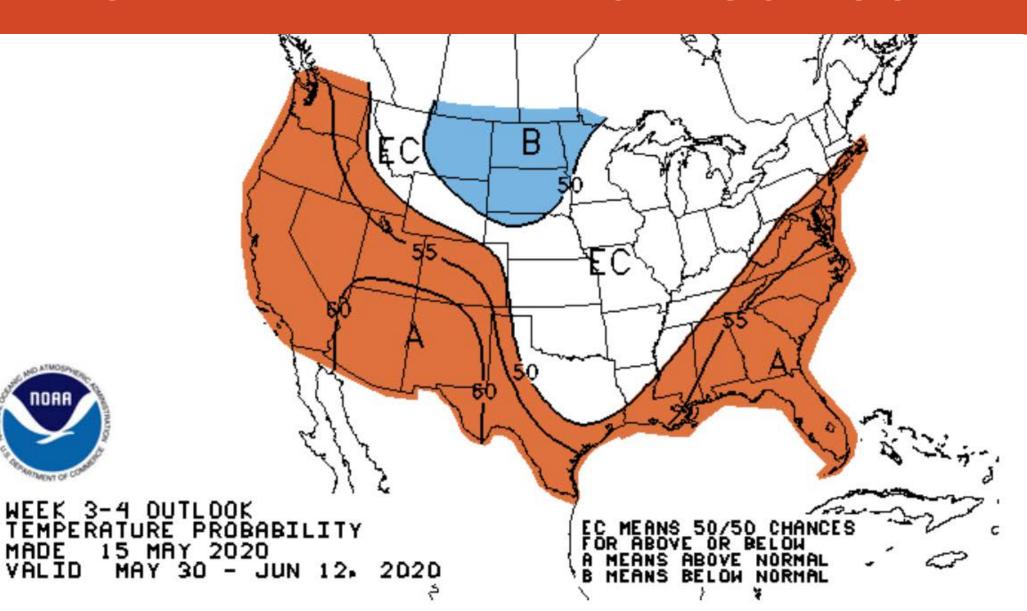


8-14 DAY PRECIPITATION OUTLOOK



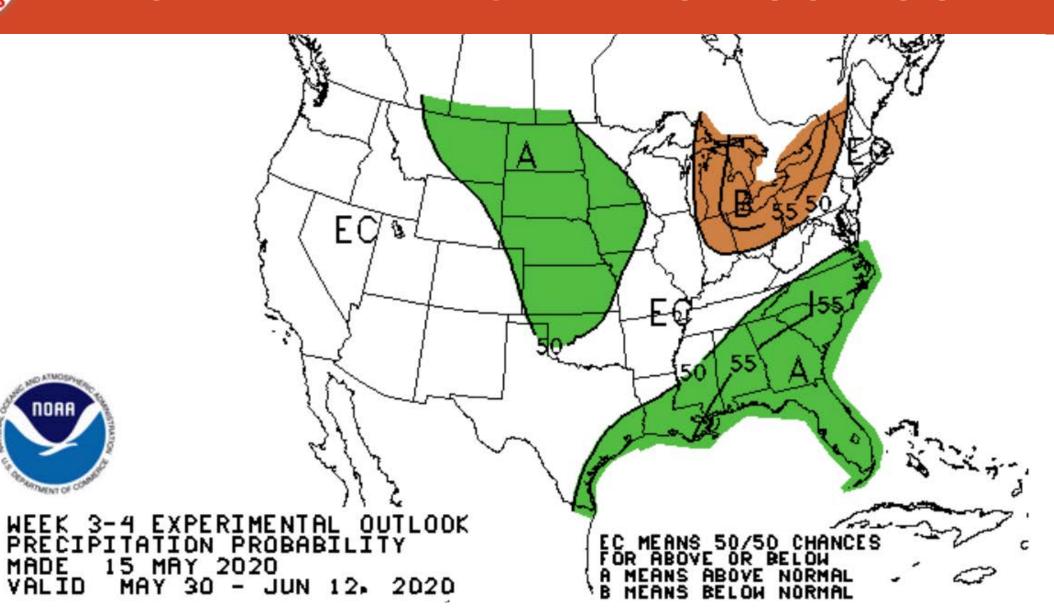


3-4 WEEK TEMPERATURE OUTLOOK





3-4 WEEK PRECIPITATION OUTLOOK





SUMMER TEMPERATURE OUTLOOK

Precipitation

Ottawa

Toronte

Detroit

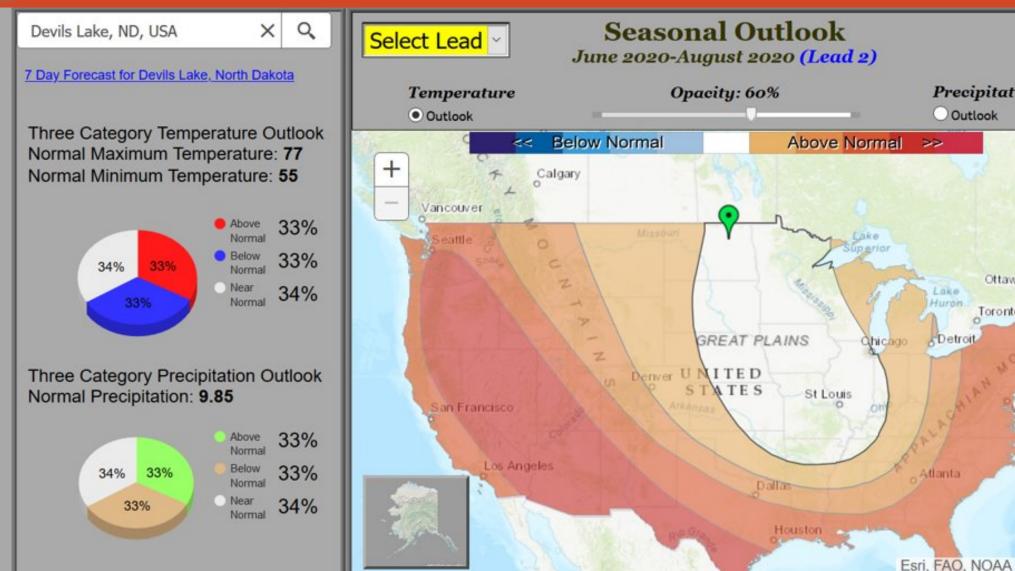
Atlanta

Montre

hiladelphi

shington

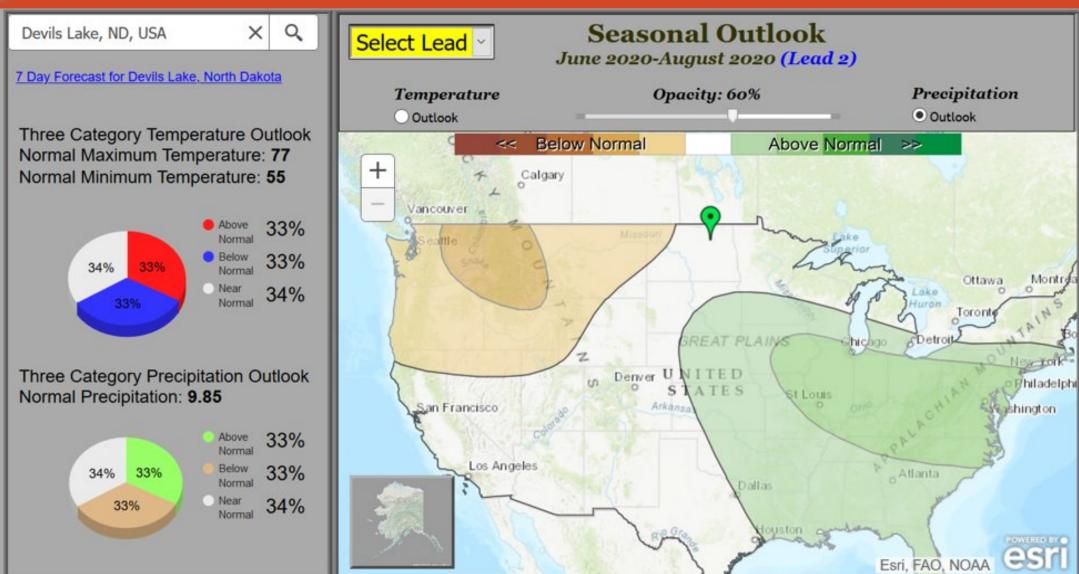
Outlook





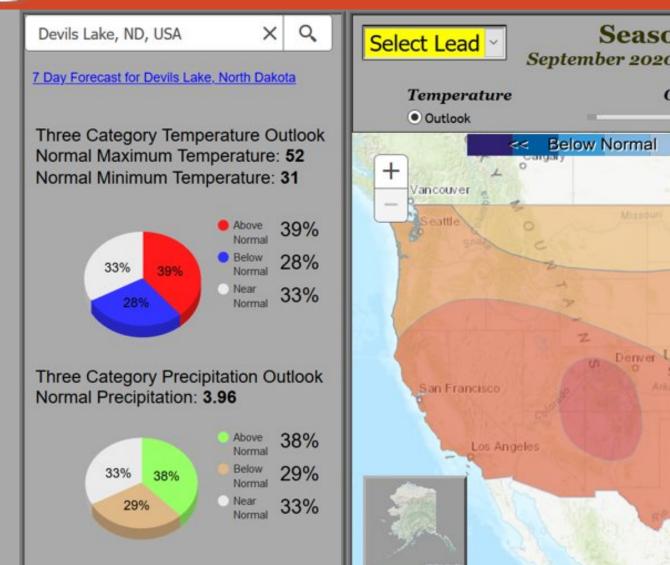
SUMMER PRECIPITATION OUTLOOK

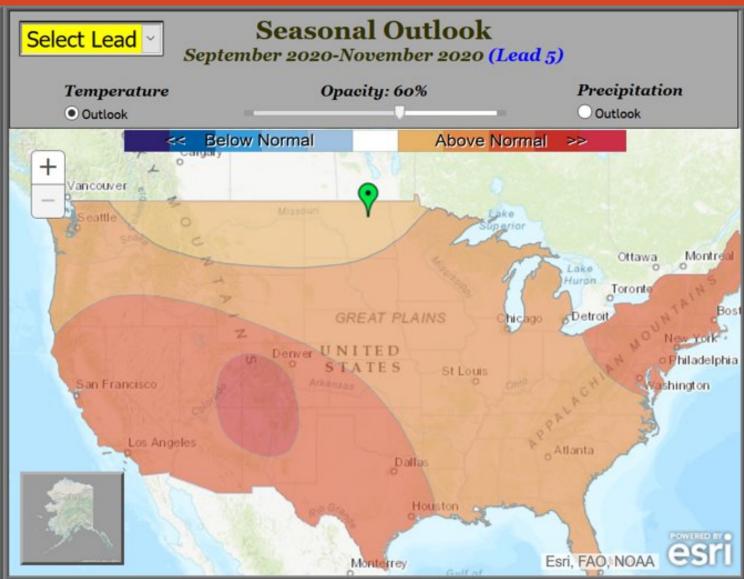
Montr





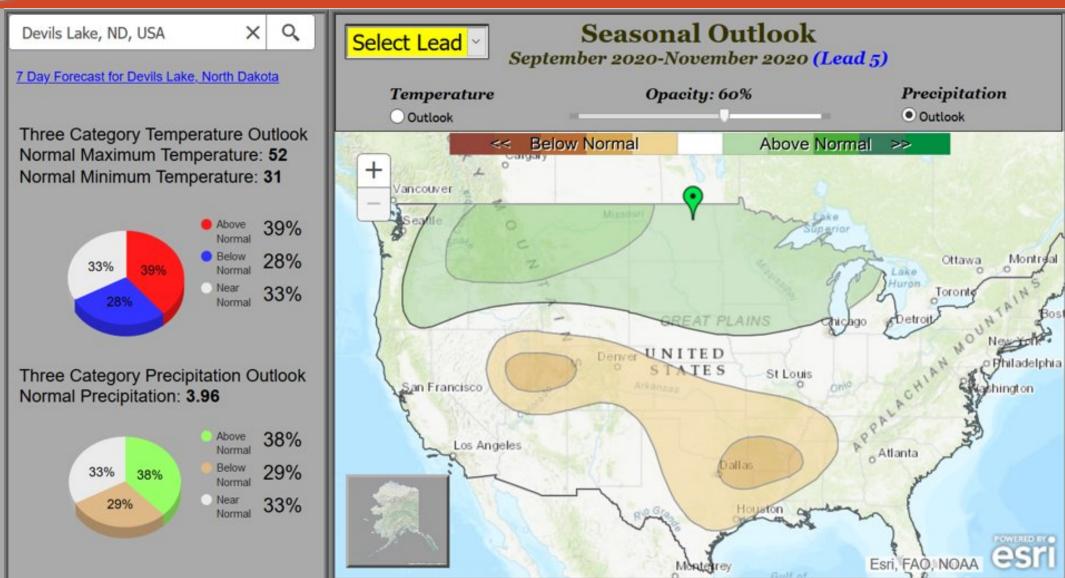
FALL TEMPERATURE OUTLOOK



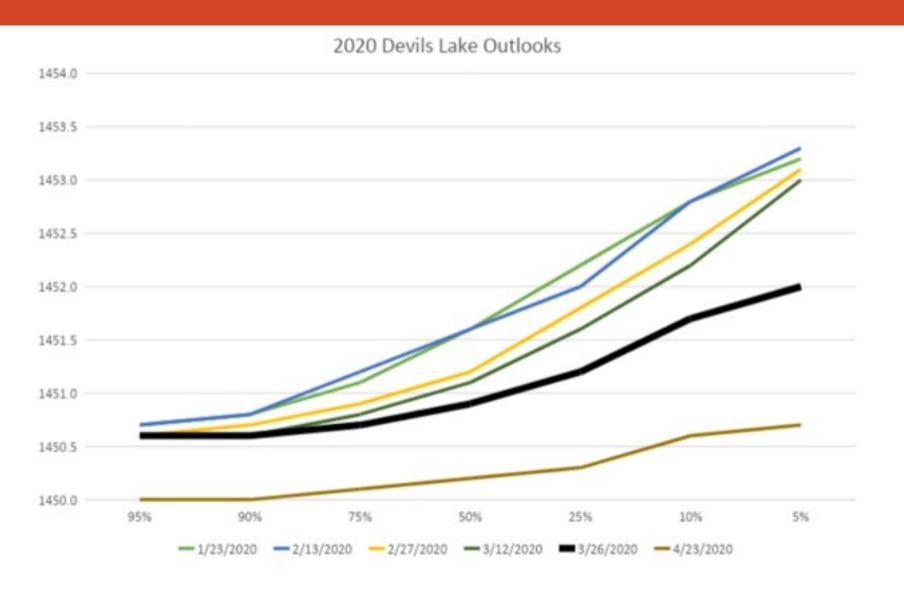




FALL PRECIPITATION OUTLOOK



APRIL 20, 2020 EXCEEDANCE PROBABILITIES



Probability	Level
90%	1450.0 ft
50%	1450.2 ft
20%	1450.4 ft
10%	1450.6 ft
<2%	1452.0 ft

Current Lake Level

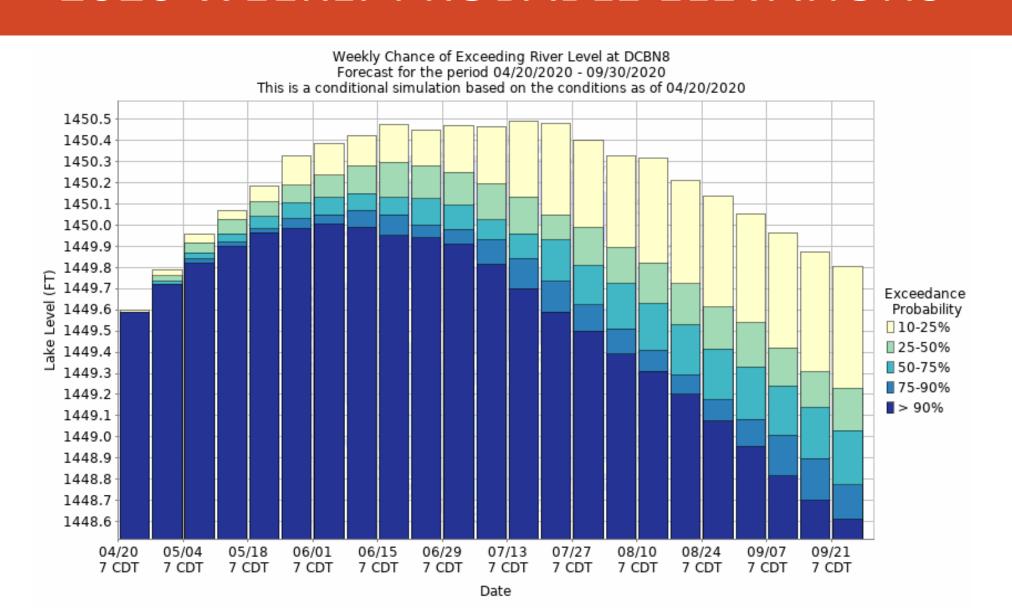
Creel Lake 1449.76 ft (5/19)

Stump Lake 1449.67 ft (5/19)

Next Outlook

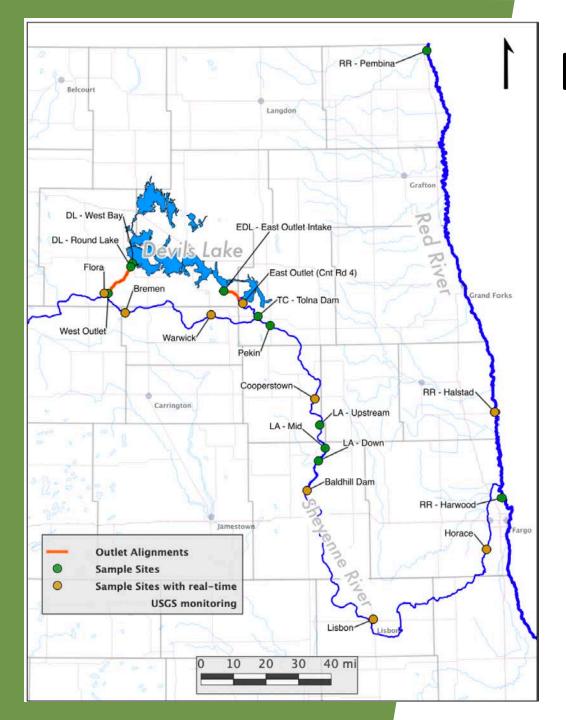
Thursday, May 28, 2020

2020 WEEKLY PROBABLE ELEVATIONS



2019 WATER QUALITY REVIEW





DEVILS LAKE OUTLET WATER QUALITY MONITORING

Outlet Discharge Is Monitored Throughout
The Sheyenne & Red Rivers

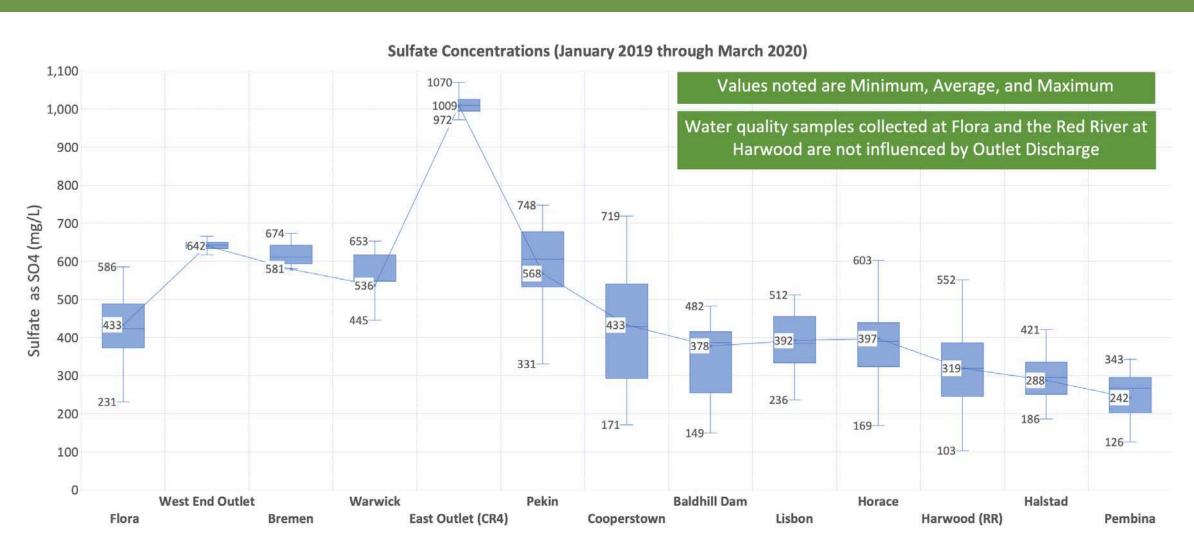
Average Of 550 Water Quality Samples
Per Year From 2012 - 2018

398 Samples Collected In 2019 Reflects
Shorter Operating Season

Majority Of The Samples Are Collected By Garrison Diversion Conservancy District Staff

SWC & USGS Staff Collect Additional Samples

SULFATE MONITORING



TOTAL DISSOLVED SOLIDS MONITORING

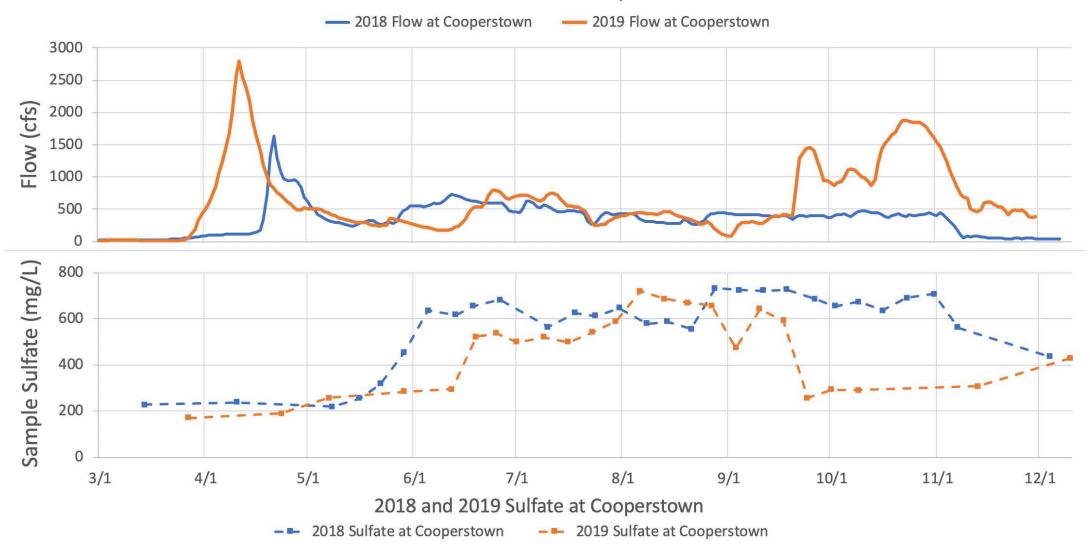


Downstream

Upstream

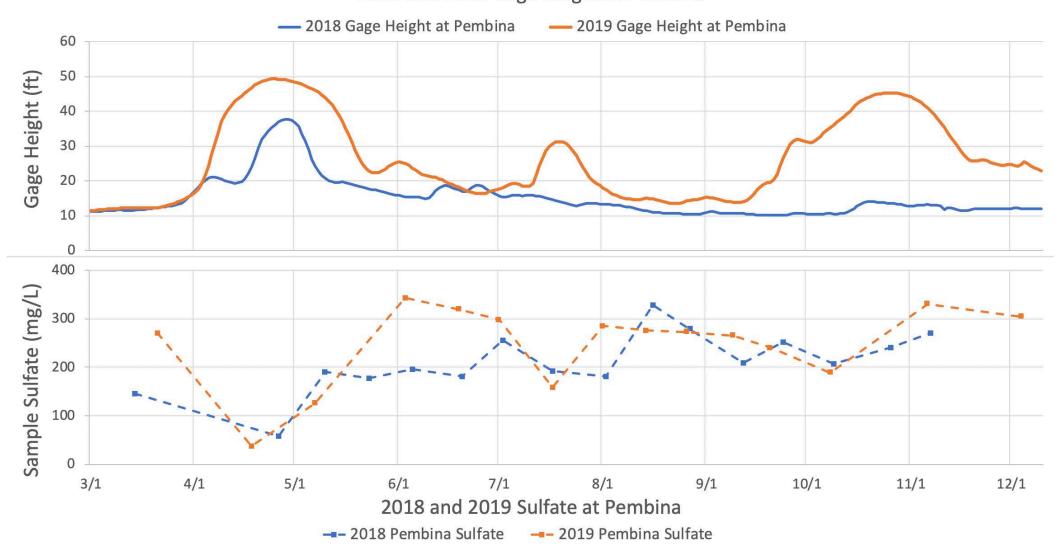
2018 COMPARED TO 2019 AT COOPERSTOWN





2018 COMPARED TO 2019 AT PEMBINA



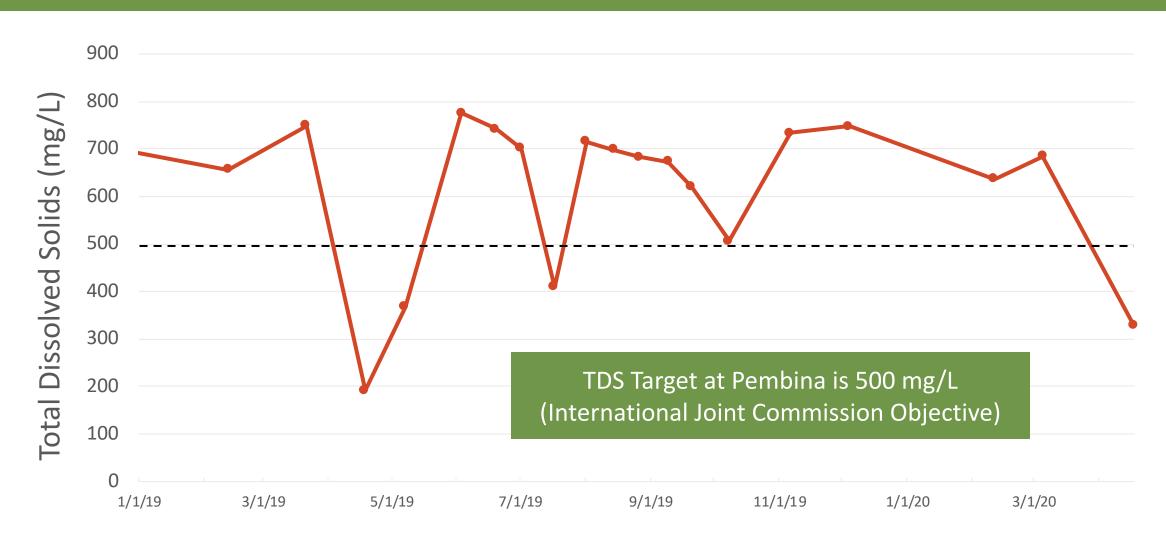


SULFATE AT PEMBINA



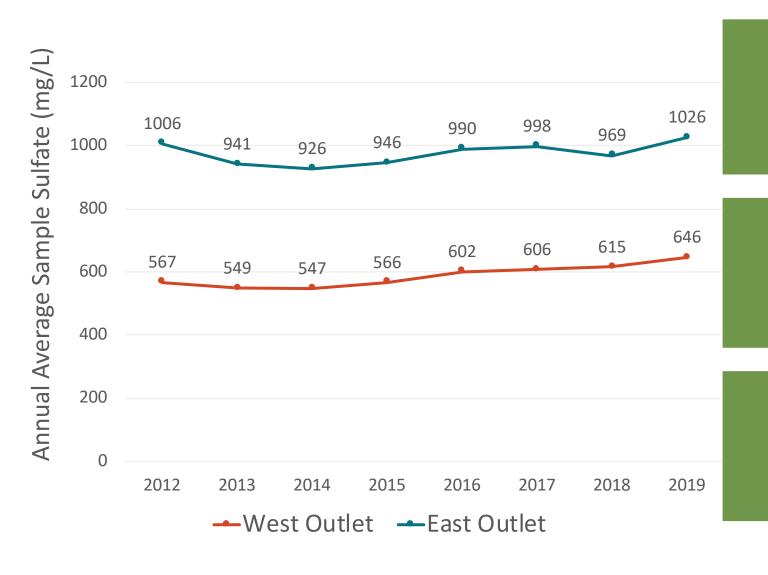
Average sample sulfate was 242 mg/L (Jan 2019 – March 2020)

TOTAL DISSOLVED SOLIDS AT PEMBINA



Average sample total dissolved solids was 628 mg/L (Jan 2019 – March 2020)

SULFATE TRENDS AT OUTLET INTAKES



Lower Lake Levels In Recent Years Have Resulted In Higher Sulfate At The Intakes

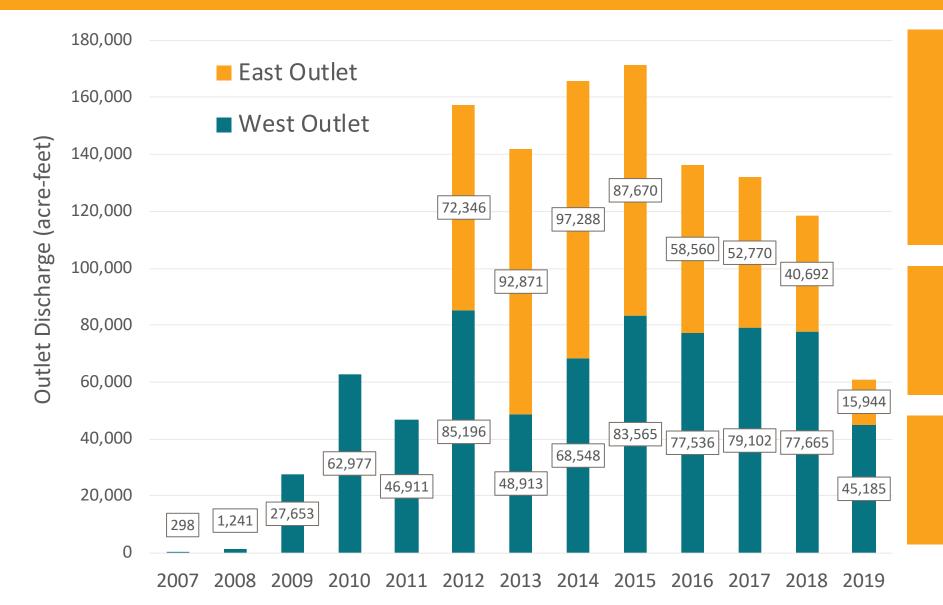
Outlet Discharge Is Reduced
To Maintain Downstream
Water Quality Standards

Recent Samples Of 578 mg/L
At West Outlet And 946 mg/L
At East Outlet

2019 OPERATIONAL SUMMARY



DEVILS LAKE OUTLET DISCHARGE 2007 – 2019

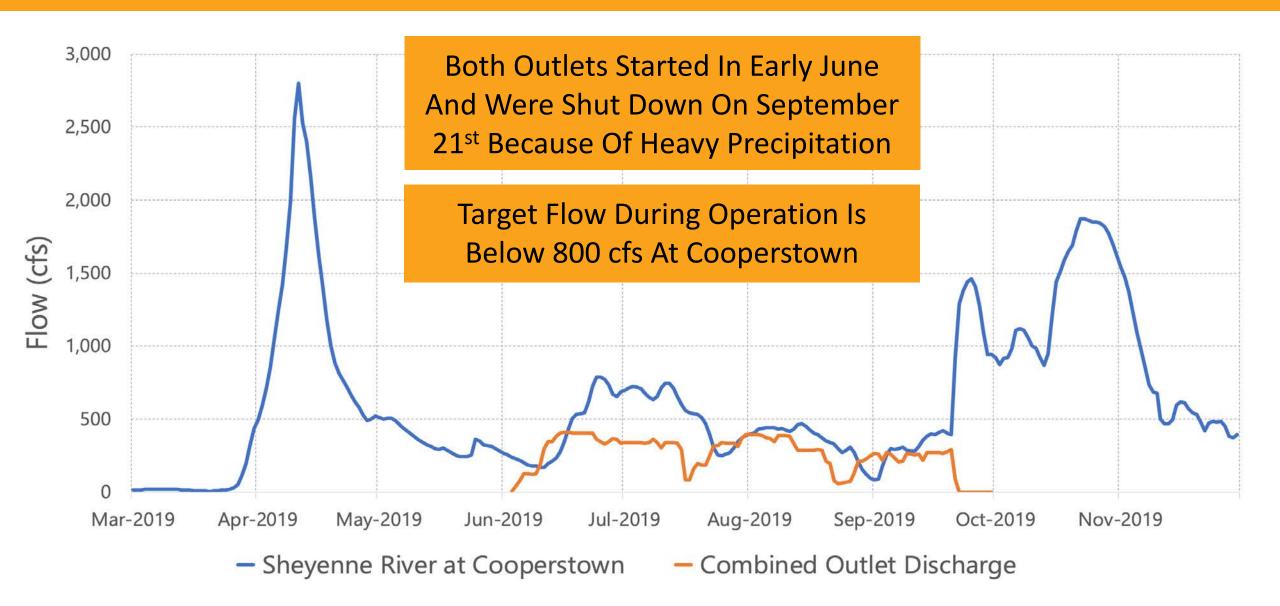


Shortened 2019
Operating Season
Limited Total
Discharge To
61,129 Acre-Feet

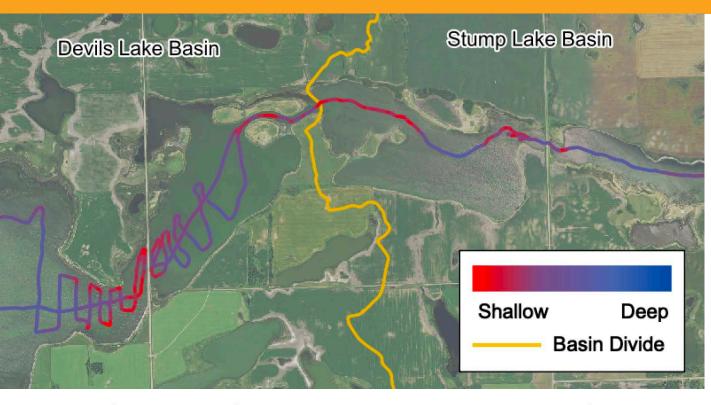
Outlets
Discharged For
108 Days In 2019

2012 -2018 Average was 188 Discharge Days Per Year

2019 SHEYENNE RIVER FLOW

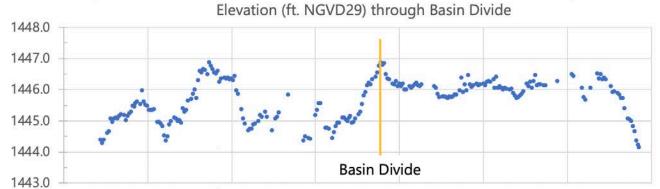


JERUSALEM CHANNEL SURVEY RESULTS



The SWC Survey Crew Investigated
The Devils Lake To Stump Lake
Connection Elevation In June 2019

The Conclusion Is That The Connection Elevation Has Not Changed Significantly

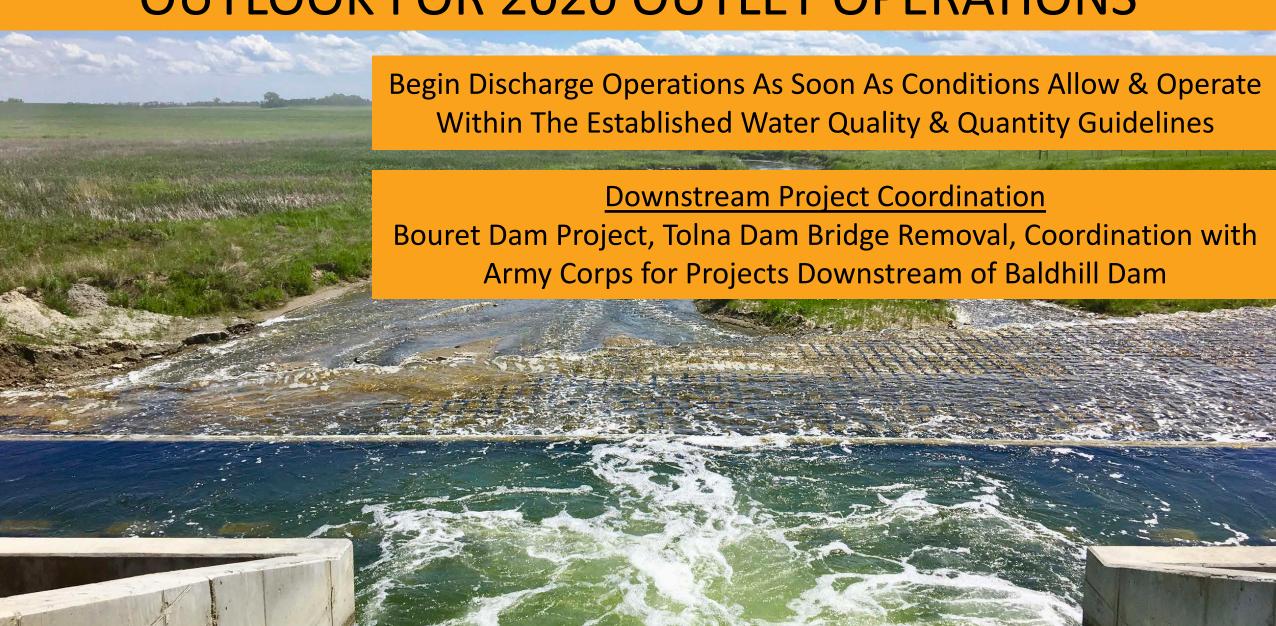


Lakes Are Substantially
Connected At An Elevation Of
1447.0 Feet (NGVD29)

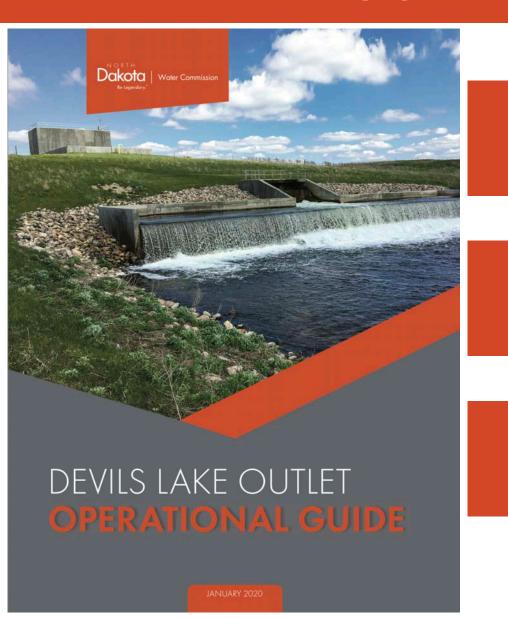
OUTLET MAINTENANCE AND MITIGATION



OUTLOOK FOR 2020 OUTLET OPERATIONS



NEW OUTLET OPERATIONAL GUIDE



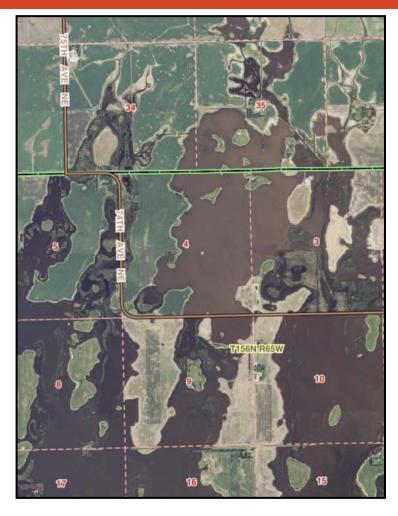
A New Devils Lake Outlet Operational Guide Has Been Developed

Guide Can Be Used As A Reference
For The Outlet Background & Specifications

Guide Is Available At:

https://www.swc.nd.gov/pdfs/outlets_operations_plan.pdf

AERIAL IMAGERY COMPARISON



Declining Lake Levels
Have Resulted in a
Significant Recovery
of Agricultural Land

Example Showing the Change From 2012 to 2018 in the Upper Basin North of Dry Lake



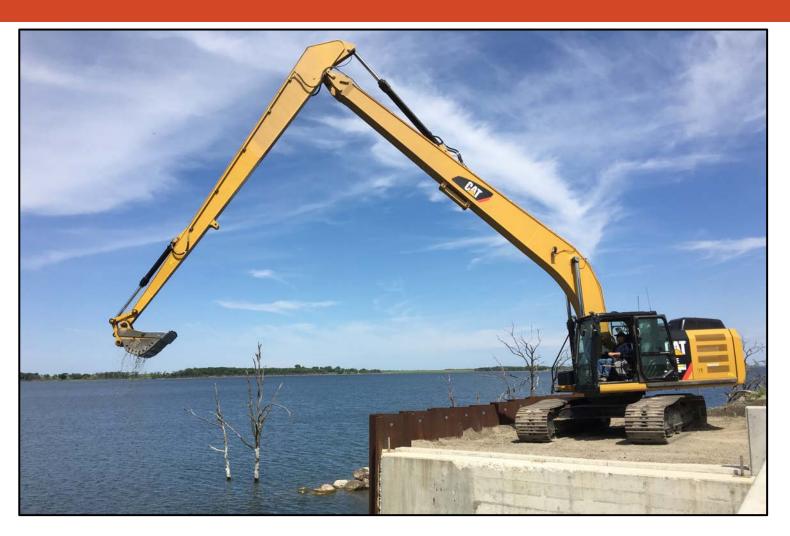
2012 NAIP
Devils Lake Elevation ≈ 1453 feet

2018 NAIP
Devils Lake Elevation ≈ 1449 feet

ONGOING OUTLET MAINTENANCE



Re-installing a Repaired Motor at the Josephine Pump Station

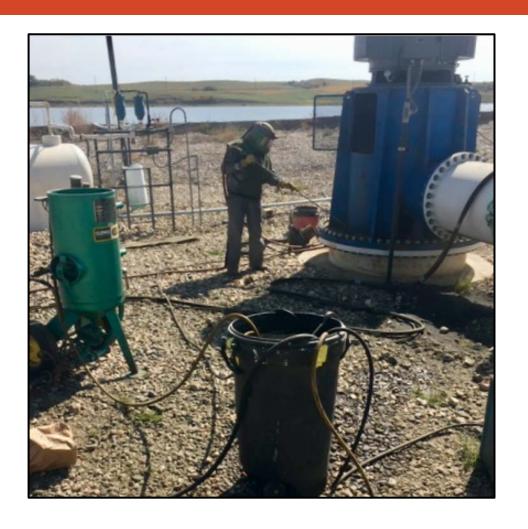


Clearing the East Outlet Intake

ONGOING OUTLET MAINTENANCE



West Outlet Canal Maintenance



Pump Maintenance at Round Lake



(701) 328-2750 / swc@nd.gov

Keep Connected



Website: www.swc.nd.gov



www.facebook.com/NDStateWater



The Current Newsletter: The Current@nd.gov